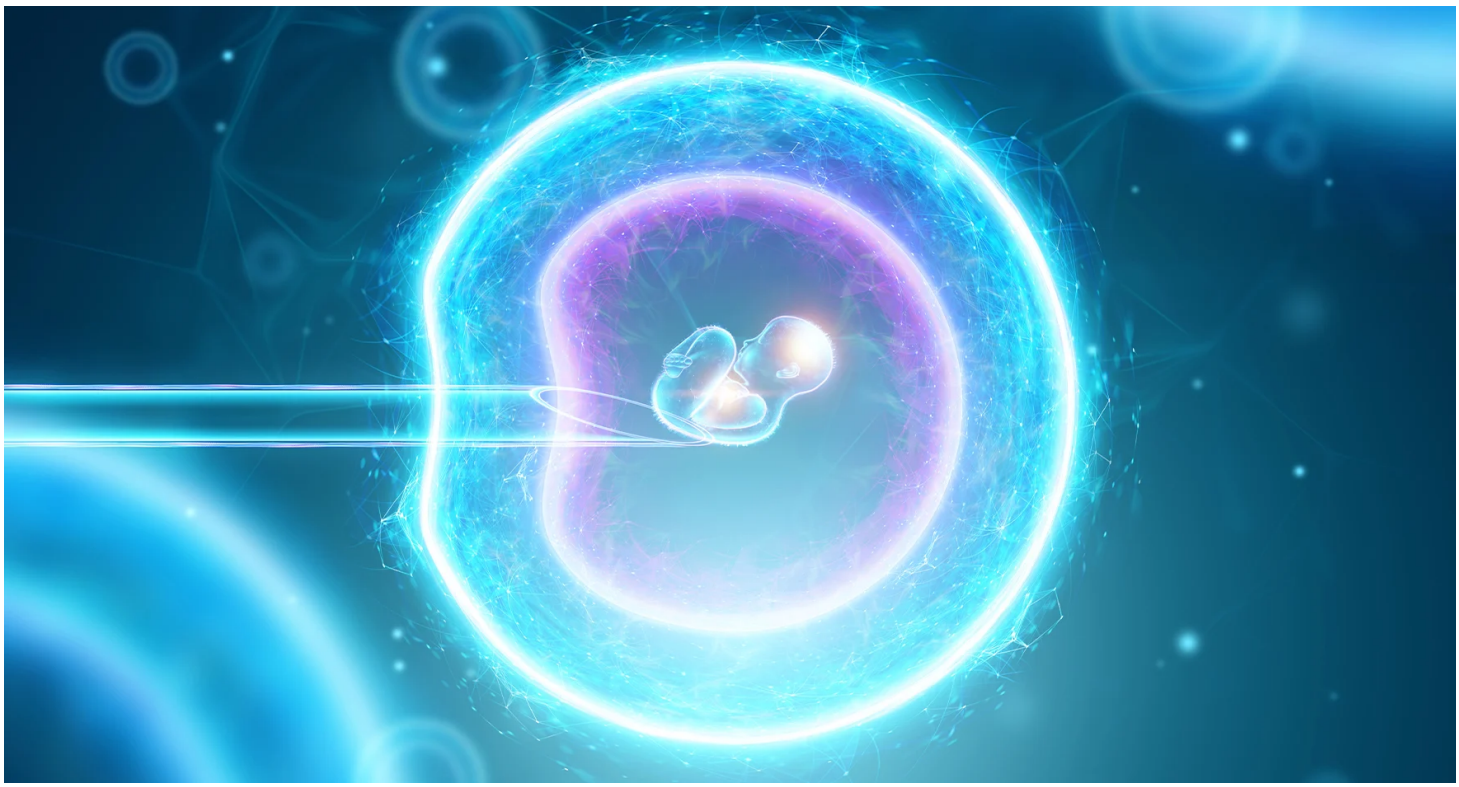

PATIENT RESOURCES

Reproductive Infertility

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Infertility is the inability of a couple to get pregnant after 12 months of regular sex without the use of birth control in women less than 35 years of age; and after six months of regular sex without the use of birth control in women 35 years and older.

For pregnancy to occur, several things have to happen:

- An egg must develop in the woman's ovary.
- The ovary must release an egg each month (ovulation). The egg must then be picked up by one of the fallopian tubes.
- A man's sperm must travel through the uterus to the fallopian tube to meet and fertilize the egg.
- The fertilized egg must travel through the fallopian tube and attach (implant) in the lining of the uterus.

If any of these events does not happen or is disrupted, infertility will result. Both female and male factors can contribute to a couple's infertility. Problems in the male partner affect about 40 percent of infertile couples. Therefore, it is important to get a complete infertility evaluation for both the man and the woman.

Endocrine Connection

About 25% of women with infertility have infrequent or absent ovulation. These women usually have irregular periods or no periods at all. Ovulation can be disrupted by changes in the way **certain hormones** are released from the hypothalamus (a part of your brain, releasing gonadotropin-releasing hormone [GnRH]) and the pituitary gland (a gland near the base of your brain, releasing luteinizing hormone [LH] and follicle-stimulating hormone [FSH]). LH and FSH signal an egg to develop and be released from the ovary.

Problems that interfere with normal LH and FSH release include:

- Injuries to the hypothalamus (a part of the brain that works with the pituitary gland)
- **Pituitary tumors**
- Being too thin or too heavy

- Exercising too much
- Extreme stress

Diagnosis and Prevention

If you and your partner are unable to conceive after a year of trying, you should speak to your primary care physician, who may refer you to a fertility specialist. A urologist or reproductive endocrinologist can help diagnose and treat male infertility. Your doctor will begin with a medical history about your menstrual cycle, past illnesses, sexually transmitted diseases, surgeries, damage to the testes, exposure to medications or harmful chemicals, and any drugs you are taking.

The next step is usually a pelvic exam to make sure your reproductive tract (vagina, uterus, and ovaries) is normal and blood tests to measure your hormone levels. Depending on what these tests find, your doctor may do further tests, including one to make sure your fallopian tubes are not blocked.

Male partners will have a semen analysis and medical history. Your doctor will do a physical exam to look for signs of low testosterone or other conditions that affect fertility (such as small or missing testes). You also will have a semen analysis (often more than one) to look at the quantity, movement, and shape of the sperm. Blood tests look for hormone deficiency. Also, your doctor might do a scrotal or transrectal ultrasound. This imaging test is to look for enlarged veins around the testes, tumors, or a blockage in the vas deferens.

▸ Female Risk Factors

Other hormonal conditions that interfere with ovulation or affect fertility are:

- Polycystic ovary syndrome (PCOS)
  An overactive or underactive thyroid
  Diabetes
  Early menopause
  Cushing's syndrome (a disorder that causes very high levels of cortisol, sometimes called "the stress hormone")

A woman's ability to get pregnant can also be affected by her age, since the number and quality of her eggs gradually decreases, beginning around age 35. Other factors include:

- Problems with the reproductive tract, like blocked or damaged fallopian tubes, scarring of the uterine lining, polyps or fibroids in the uterus, and endometriosis
- Sexually transmitted diseases, like chlamydia and gonorrhea, that can cause tubal blockages
- Excessive caffeine (more than 2 cups of coffee per day), any smoking or alcohol, or recreational drugs like cocaine and marijuana
- Certain medications like antidepressants, tranquilizers, calcium channel blockers, narcotics, and anti-cancer drugs
- Chronic medical conditions like kidney disease, liver disease, sickle cell disease, HIV/AIDS, and hepatitis B or C

▸ **Male Risk Factors**

Heat can affect sperm production. Heat damage may occur if one or both testes fail to descend from near the stomach (where they are located before birth) into the scrotum (the sac of skin that normally holds the testes). Many men have enlarged veins around the testes (known as varicocele) that may also raise the temperature in the testes. If they are very large, varicocele may cause low sperm production.

Certain inherited (genetic) diseases can cause low or no sperm production or sperm that have decreased mobility.

In 10 to 20 percent of cases, the problem is a blockage in the sperm's path from the testes, through tubes called the vas deferens to the penis. This can be caused by scarring from an infection, a vasectomy (surgery to cut the vas deferens and prevent passage of sperm), or cystic fibrosis (a genetic disease). Backward movement of sperm into the bladder, instead of out through the penis, can also cause infertility.

Rarely, infertility results from a hormone deficiency. Luteinizing hormone (LH) and follicle-stimulating hormone (FSH) cause the testes to produce testosterone and sperm. The pituitary gland, located in the brain, makes these hormones. Any condition that lowers LH and FSH levels, such as a pituitary tumor, can result in low or no sperm production and low blood testosterone levels.

In 30 to 40 percent of men with infertility, the cause cannot be found, these men usually have abnormal sperm (for instance, sperm that are slow moving, abnormal in shape, or low in number).

Other problems may decrease sperm production and fertility. They include chronic (long-term) illness, poor overall health, obesity, certain prescription drugs, and drug abuse.

▸ **Treatment and Therapies**

Treatment of infertility depends on the cause and your age. It falls into two main categories: one helps fertility through medications or surgery, and the other uses assisted reproductive technologies.

Fertility Drugs

Clomiphene, taken as a pill, and FSH and LH hormone injections are the main treatment for women with ovulation disorders. Women with no clear cause of their infertility might also use these drugs. Pills like clomiphene or aromatase inhibitors (letrozole, used off-label) increase LH to induce ovulation. Injections of GnRH, LH, or FSH help mature eggs and induce ovulation. Sometimes doctors use drug treatment with intrauterine insemination (IUI), when sperm are released into the uterus through a catheter (a thin flexible tube) inserted through the vagina. IUI is done at the time of ovulation.

If the cause is due to low testosterone, treatment with hormone injections (LH and FSH) is usually successful. However, it may take a year or longer of hormone therapy to get enough sperm production and bring back fertility.

Surgery

Surgery may help women with fibroids, uterine polyps, scarring, or endometriosis. Surgery may also be an option for some women with blocked fallopian tubes, but it depends on your age and the type of blockage. Any surgery to unblock a fallopian tube may increase the risk of ectopic (tubal) pregnancy.

Surgery can repair a blockage in the sperm transport system. Vasectomy can be surgically reversed in up to 85 percent of cases, but many men remain infertile even after the blockage is fixed (other types of blockage such as those caused by past infections can be harder to treat). Repair of varicoceles is more likely to bring back fertility if the veins are large and if the repair is done before any long-term damage. Surgery also can repair varicoceles, but it may not restore fertility.

Assisted Reproductive Technology

Other options for a couple to achieve pregnancy include assisted reproductive technologies. These treatments include inserting collected sperm into the womb, mixing sperm with an egg outside the body (in vitro fertilization or IVF), or injecting a single sperm into an egg (intracytoplasmic sperm injection or ICSI). Some women with very few remaining eggs in their ovaries choose IVF using a donor egg.

To improve your chances of successful treatment, it is helpful to maintain a healthy lifestyle— exercise often, eat a healthy diet, and do not smoke or use recreational drugs. Also, continue treatment for any chronic illness.

Egg Freezing

Egg freezing may be an option if a woman is not ready to become pregnant immediately but wants the option of becoming pregnant later. Egg freezing, referred to as oocyte cryopreservation, refers to the process of removing a woman's eggs from the ovary and storing them at below freezing temperatures so they can be thawed and fertilized at a future date.

A woman will be given synthetic hormones to increase egg production in the ovaries. When the eggs are mature, they are removed from the ovaries with a long needle. This procedure is done with sedation, so it is not painful. After the eggs are removed, they are placed in the freezer until the woman is ready to get pregnant.

Certain medical treatments such as radiation and chemotherapy for cancers can affect a woman's ability to become pregnant so egg freezing may be a good option. Women also may freeze their eggs if they have a condition that can affect fertility such as autoimmune diseases, sickle cell anemia, or being transgender.

Risks of egg freezing are rare but are important to keep in mind. Swollen painful ovaries (ovarian hyperstimulation syndrome) in response to the synthetic hormones used to increase egg production. Symptoms of ovarian hyperstimulation syndrome can include abdominal pain, bloating, nausea, vomiting and/or diarrhea. Although rare, the use of a needle to remove eggs from the ovary can cause bleeding, infection or damage to internal organs.

▸ **Questions For Your Healthcare Provider**

- If my partner is infertile, what treatments are available to him?
- What tests do I need to find the cause of my infertility?
- How much does treatment cost? Does insurance cover infertility treatment?
- Should I see a specialist like a reproductive endocrinologist?
- Is egg freezing a good option for me?
- What is the cause or causes of my infertility?
- What are the risks, benefits, and success rates of each of these treatments?
- Should I see a reproductive endocrinologist (urologist)?

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